

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To: LEE, Young-Pil The Cheonghwa Bldg. 1571-18 Seocho-dong, Seocho-gu Seoul 137-874 Republic of Korea

PCT

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

(PCT Rule 43bis.1)

Applicant's or agent's file reference GN-21588-PCT	FOR FURTHER ACTION See paragraph 2 below
International application No. PCT/KR2004/000577	International filing date (day/month/year) 17 MARCH 2004 (17.03.2004)
Priority date(day/month/year) 20 MARCH 2003 (20.03.2003)	
International Patent Classification (IPC) or both national classification and IPC IPC7 B82B 3/00	
Applicant LEE, Cheol-Jin	

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application


2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/KR  Korean Intellectual Property Office 920 Dunsan-dong, Seo-gu, Daejeon 302-701, Republic of Korea Facsimile No. 82-42-472-7140	Authorized officer JWA, Seung Kwan Telephone No. 82-42-481-5560
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Box No. 1 Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This opinion has been established on the basis of a translation from the original language into the following language _____, which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).

2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material

- ☐ a sequence listing
☐ table(s) related to the sequence listing

b. format of material

- ☐ in written format
☐ in computer readable form

c. time of filing/furnishing

- ☐ contained in the international application as filed.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

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Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-7	YES
	Claims	NONE	NO
Inventive step (IS)	Claims	NONE	YES
	Claims	1-7	NO
Industrial applicability (IA)	Claims	1-7	YES
	Claims	NONE	NO

2. Citations and explanations :

The following documents are referred to:

D1 = JP 2001-20071 A

D2 = US 2002/165091 A1

1. Claims1-7 relate to a synthesis method of double-walled carbon nanotubes comprising the following steps as a main technical feature: impregnating metallic catalytic particles into nano-pores of main body consisting of MgO, Al₂O₃, zeolite, or silica; sintering the main body impregnated with the metallic catalytic particles and synthesizing double-walled carbon nanotubes by a catalytic reaction between the metallic catalytic particles and a carbon source gas, by supplying the carbon source gas to the metallic catalytic particles impregnated into the main body.

2. D1 provides a method for the mass-synthesis of high purity carbon nanotubes perpendicularly arranged on a substrate by a thermochemical vapor phase deposition method. D2 provides the metallic catalytic particles for producing single-walled carbon nanotubes. The catalytic particles contain at least one metal from Group VIII, including Co, Ni, Ru, Rh, Pd, Ir, and Pt, and at least one metal from Group VIb including Mo, W and Cr. The metal component is on a supporter such as silica.

3. Comparing the present claims1-7 with D1 and D2, there is no remarkable difference between this invention(claims1-7) and D1 in the process of producing carbon nanotubes by a catalytic reaction between metallic catalytic particles and a carbon source gas, and the process of producing carbon nanotubes by impregnating metallic catalytic particles such as Co, Mo and Ni into a supporter such as silica of this invention, which is not described by D1, is not particularly different from the disclosure of D2. So, this subject matter can be readily invented from a simple combination of D1 and D2 by a person skilled in this art.

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Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of :

Box No. V

4. Consequently, claims 1-7 meet the criteria set out in Article 33(2) and (4) PCT, but do not meet the criteria set out in Article 33(3) PCT because this subject matter can be readily invented from a simple combination of D1 and D2 by a person skilled in the art.